(12) INTERNATIONAL A

ICATION PUBLISHED UNDER THE PATENT C



(19) World Intellectual Property Organization International Bureau

(43) International Publication Date [/ 15 January 2004 (15.01.2004)

(10) International Publication Number WO 2004/005951 A3

(51) International Patent Classification7: G01R 33/385

(21) International Application Number:

PCT/IB2003/002871

(22) International Filing Date: V 13 June 2003 (13.06.2003)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

02077687.8

V 4 July 2002 (04.07.2002)

- (71) Applicant (for all designated States except US): KONIN-KLIJKE PHILIPS ELECTRONICS N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): ROOZEN, Nicolaas, B. [NL/NL], c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). BILOEN, David [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). OVERWEG, Johannes, A. [NL/NL]; c/o Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).
- (74) Agent: WOLFS, Marc, J., M., Philips Intellectual Property & Standards, Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).

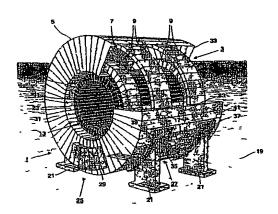
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report: 11 March 2004

[Continued on next page]

(54) Title: AN MRI SYSTEM WITH A CONDUCTIVE MEMBER HAVING A DAMPING EFFECT FOR VIBRATIONS



(57) Abstract: The invention relates to a magnetic resonance imaging (MRI) system (1) comprising a damping member (25, 27) which is mounted to a part (5) of the MRI system susceptible to vibrations relative to the magnetic field during operation. Said damping member comprises an electrically conductive member (29, 35, 37) which is present in the magnetic field and in which eddy currents are generated as a result of said vibrations. The conductive member (29, 35, 37) is arranged in a secondary portion of the magnetic field at a distance from the main field portion (17), which secondary portion has a magnetic field strength which differs by more than 25% from the magnetic field strength (Bo) of the main field portion. In this manner, the distance between the conductive member and the main field portion is sufficiently large to prevent the eddy currents in the conductive member from causing unacceptable distortions of the main field portion, while, on the other hand, the magnetic field strength in said secondary portion is still sufficiently large to provide an adequate damping effect of the damping member (25, 27).



/005951 A3 ||||||



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

Interna Application No PCT/ 3/02871

A CLASSIFICATION OF SUBJECT MATTER IPC 7 G01R33/385

According to International Patent Classification (IPC) or to both national classification and IPC

B FIELDS SEARCHED

 $\begin{array}{ll} \text{Minimum documentation searched (classification system followed by classification symbols)} \\ IPC 7 & G01R \end{array}$

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and where practical search terms used)

EPO-Internal, INSPEC, EMBASE, WPI Data, PAJ

C DOCUM	ENTS CONSIDERED TO BE RELEVANT	
Calegory °	Citation of document with indication where appropriate of the relevant passages	Relevant to claim No
X	EP 0 785 442 A (OXFORD MAGNET TECH) 23 July 1997 (1997-07-23) column 3, line 39 -column 5, line 22; figures 1,2	1-3,8, 11,12
X	US 5 565 831 A (DORRI BIZHAN ET AL) 15 October 1996 (1996-10-15) column 4, line 56 -column 5, line 54 column 6, line 29 -column 6, line 60; figure 2	1-3,8,12
X	EP 1 214 906 A (HITACHI MEDICAL CORP; MITSUBISHI ELECTRIC CORP (JP)) 19 June 2002 (2002-06-19) paragraphs '0016!-'0041!; figures 2-10 -/	1-4,8,12

Further documents are listed in the continuation of box C	Palent family members are listed in annex
Special categories of cited documents A* document defining the general state of the art which is not considered to be of particular relevance E* earlier document but published on or after the international filling date C* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) O* document referring to an oral disclosure use exhibition or other means P* document published prior to the international filling date but later than the priority date claimed	*T* later document published after the international filing date or pnortly date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents such combination being obvious to a person skilled in the art *&* document member of the same patent family
Date of the actual completion of the international search 4 December 2003	Date of mailing of the international search report 29/12/2003
Name and mailing address of the ISA European Patent Office P B 5618 Patentlaan 2 NL - 2280 HV Rijswijk Tel (+31-70) 340-2040 Tx 31 651 epo nl Fax (+31-70) 340-3016	Authorized officer Lersch, W

INTERNATIONAL SEARCH REPORT

Application No PC 03/02871

C (Ca-4)-	elian poet uranza conse	PC 03/02871
Calegory °	ation) DOCUMENTS CONSIDERED TO BE RELEVANT Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,A	DE 101 16 623 C (BRUKER BIOSPIN GMBH) 5 December 2002 (2002-12-05) paragraphs '0011!,'0028!,'0040!-'0053!; figures 1-4	1,4
A	DE 199 47 539 A (BRUKER ANALYTIK GMBH) 19 April 2001 (2001-04-19) column 3, line 60 -column 4, line 9	1
A	KATSUNUMA A ET AL: "Quiet MRI with novel acoustic noise reduction" MAGNETIC RESONANCE MATERIALS IN PHYSICS, BIOLOGY AND MEDICINE, CHAPMAN AND HALL, LONDON, GB, vol. 13, no. 3, January 2002 (2002-01), pages 139-144, XP002246720 ISSN: 1352-8661 the whole document	1
A	EDELSTEIN W A ET AL: "Making MRI quieter" MAGNETIC RESONANCE IMAGING, FEB. 2002, ELSEVIER, USA, vol. 20, no. 2, pages 155-163, XP002263702 ISSN: 0730-725X the whole document	1
	0 (continuation of second sheet) (July 1992)	

INTERNATIONAL SEARCH REPORT

Interna	Application No
PCT/1	3/02871

				.	
Patent document cited in search report		Publication date		Patent family member(s)	Publication date
EP 0785442	A	23-07-1997	GB	2309305 A	23-07-1997
			DE	69708345 D	03-01-2002
			DE -	69708345 Ta	
			EP	0785442 A	
			JP	9223620 A	26-08-1997
			US	5982260 A	09-11-1999
US 5565831	Α	15-10-1996	EP	0770881 A	02-05-1997
			JP	9187439 A	22-07-1997
EP 1214906	A	19-06-2002	JP	2001078982 A	27-03-2001
			ΕP	1214906 A	
			WO	0119242 A	
DE 10116623	С	05-12-2002	DE	10116623 C	05-12-2002
	_		GB	2379019 A	26-02-2003
			US	2002140428 A	
DE 19947539	 А	19-04-2001	DE	19947539 A	19-04-2001
			GB	2356056 A	09-05-2001
			ÜS	6501275 B	

THIS PAGE BLANK (USPTO)